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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,727	06/20/2005	Friedrich Boecking	R.304041	8609

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT	PAPER NUMBER
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2834

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/539,727	Applicant(s) BOECKING, FRIEDRICH	
	Examiner Thomas M. Dougherty	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-12, 16-19, 21-24 and 26 is/are rejected.
- 7) ☒ Claim(s) 13-15, 20, 25 and 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) * | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) *
Paper No(s)/Mail Date <u>605</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9, 10, 12, 16-19, 21, 22, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuh et al. (US 6,316,863) in view of Heinz et al. (US 6,507,140). Schuh et al. show (fig. 1) a piezoelectric actuator including a multilayered structure of piezoelectric layers (KS) with inner electrodes (E1, E2) interspersed between them, a contacting of the inner electrodes (E1, E2) on alternating sides with outer electrodes (MS1, MS2) that can supply an electrical voltage, the contacting of the inner electrodes (E1, E2) is provided in the corner region of the piezoelectric actuator:

They show an extension (AE) extending outwardly beyond the multilayered structure of piezoelectric layers (KS) and can be provided with a terminal there.

The outer electrode (MS1) extends laterally from the piezoelectric layers and is provided with a terminal (AE) there.

The respective outer electrode (MS1, MS2) and/or the terminal (AE) is/are made of metal.

Schuh et al. do not show the outer electrodes as being net-like, mesh-like, or screen-like outer electrode. Schuh et al. do not note use of Invar. It is not clear that Schuh et al. use solder.

Heinz et al. show (figs. 1-3) a piezoelectric actuator including a multilayered structure of piezoelectric layers with inner electrodes (2, 3) interspersed between them, a contacting of the inner electrodes (2, 3) on alternating sides with outer electrodes (7) that can supply an electrical voltage, the respective outer electrode (7) being attached in a net-like, mesh-like, or screen-like fashion and contacting the respective inner electrodes (2, 3) at least at points.

The outer electrode (7) extends laterally from the piezoelectric layers and is provided with a terminal (inherent) there.

The respective outer electrode (7) and/or the terminal is/are made of Invar (col. 2, line 27).

The respective net-like, mesh-like, or screen-like outer electrode (7) and/or the terminal is/are soldered to the respective inner electrodes (2, 3). See col. 2, lines 29 and 30.

Heinz et al. do not show contacting of the inner electrodes at the corner region of the piezoelectric actuator.

It would have been obvious to one of ordinary skill in the art to employ the electrode material and connection means of Heinz et al. in the device of Schuh et al. at the time of their invention in order to reduce mechanical stresses and cracks as Heinz et al. note at col. 1, lines 33+.

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Claims 11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuh et al. (US 6,316,863) in view of Heinz et al. (US 6,507,140). Given the combined invention of Schuh et al. and Heinz et al., said combination would not result in the extension and terminal being disposed in the region of the cross section of the piezoelectric actuator. It would have been obvious to one having ordinary skill in the art at the time the invention was made to so locate the extension and terminal in the combined device of Schuh et al. and Heinz et al. since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Allowable Subject Matter

Claims 13-15, 20, 25 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest a net-like, mesh-like or screen-like outer electrode wrapped around an edge of a piezoelectric multilayer device so as to provide signals to internal electrodes further including a terminal and including a rolled portion.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional prior art cited shows various outer electrode configurations including corner placement and mesh configurations.

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Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd
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December 29, 2006

Thomas M. Dougherty

**TOM DOUGHERTY
PRIMARY EXAMINER**